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# Marine Physical Laboratory

## Vertical Source Array Development

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Supported by the  
Chief of Naval Research  
Contract N00014-93-D-0141 (DO#7)

## Final Report

MPL-U-52/95  
August 1995

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University of California, San Diego  
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DTIC QUALITY INSPECTED 1

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. Agency Use Only (Leave Blank).		2. Report Date. August 1995		3. Report Type and Dates Covered. Final Report
4. Title and Subtitle. Vertical Source Array Development			5. Funding Numbers. N00014-93-D-0141(DO#7)  Project No. Task No.	
6. Author(s). W. S. Hodgkiss				
7. Performing Monitoring Agency Name(s) and Address(es). University of California, San Diego Marine Physical Laboratory Scripps Institution of Oceanography San Diego, California 92152			8. Performing Organization Report Number. MPL-U-52/95	
9. Sponsoring/Monitoring Agency Name(s) and Address(es). Chief of Naval Research Department of the Navy 800 North Quincy Street Arlington, VA 22217-5660 Code 334			10. Sponsoring/Monitoring Agency Report Number.	
11. Supplementary Notes.				
12a. Distribution/Availability Statement. Approved for public release; distribution is unlimited.			12b. Distribution Code.	
13. Abstract (Maximum 200 words).  Initial testing of prototype transducers for a vertical source array has been completed along with the design of a 600 m umbilical cable and calculation of the transducer tuning requirements.				
14. Subject Terms. vertical source array, prototype transducers, umbilical cable design, transducer tuning requirements			15. Number of Pages. 2	
			16. Price Code.	
17. Security Classification of Report. Unclassified	18. Security Classification of This Page. Unclassified	19. Security Classification of Abstract. Unclassified		20. Limitation of Abstract. None

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William S. Hodgkiss

Final Report to the  
Office of Naval Research  
Contract N00014-93-D-0141 (DO #7)  
for the Period 5-1-94 - 10-31-94

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## *Abstract*

Initial testing of prototype transducers for a vertical source array has been completed along with the design of a 600 m umbilical cable and calculation of the transducer tuning requirements.

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## *Research Objective*

The objective of this project was to assist NRaD in the design and development of a vertical source array.

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## *Research Summary*

The traditional approach in active surveillance has been to use one or a few high power transmitting sources to couple acoustic energy into the water column. When arranged as a vertical array of sources, the total aperture typically has been only a few wavelengths. As a consequence, the radiation pattern has significant sidelobes which intersect the sea surface and bottom and reverberation (scatter) from these boundaries is a major inhibitor to target detection. One approach to reducing the amount of energy ensonifying the boundaries is to utilize a vertical source array

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## References

with full water column aperture and thus better control over the radiation pattern.

The focus of this effort was twofold. First, MPL assisted NRaD in initial testing of the prototype transducers to be used in the vertical source array. Second, MPL carried out the 600 m umbilical cable design and the transducer tuning requirements for the vertical source array. These calculations were provided to NRaD in [1].

## *References*

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- [1] G.E. Edmonds, "FWCA Design Review" (Presentation to NRaD, 25 March 1994).

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